

What is claimed is:

1. A process for converting methane to higher hydrocarbons, comprising applying ultraviolet light to methane under conditions effective to cause its photodissociation and polymerization to C2+ and higher hydrocarbons.
2. A process as defined in Claim 1, wherein per-pass conversion is at least about 45%.
3. A process as defined in Claim 2, wherein per-pass conversion is at least about 50%.
4. A process as defined in Claim 3, wherein per-pass conversion is at least about 55%.
5. A process as defined in Claim 1, further comprising the step of cooling the C2+ hydrocarbons to provide a transportable liquid hydrocarbon product.
6. A process as defined in Claim 5, wherein ultraviolet light is applied to the methane in natural gas.
7. A process as defined in Claim 5, wherein ultraviolet light is applied to the methane in natural gas from which non-hydrocarbon impurities have been removed.
8. A process as defined in Claim 5, further comprising recovering and recycling unconverted methane prior to cooling the C2+ hydrocarbons to provide the transportable liquid product.

9. A process as defined in Claim 1, wherein the ultraviolet light is applied within a conduit lined with a series of devices emitting ultraviolet light having a photon energy of at least about 1.7 electron volts.
10. A process as defined in Claim 9, wherein the pressure within the conduit is maintained at 10 atmospheres gauge or greater.
11. A process as defined in Claim 1, applied to natural gas produced from an offshore natural gas-producing well.
12. A process as defined in Claim 1, applied to natural gas entering a natural gas processing plant.
13. Apparatus for converting natural gas produced from a well site which is too remote to permit economic recovery of the natural gas through an associated pipeline to a transportable liquid hydrocarbon product, comprising means for applying ultraviolet light to the natural gas to photodissociate methane therein and polymerize the same to C₂+ hydrocarbons, and means for cooling the C₂+ hydrocarbons to a sufficient extent whereby the transportable liquid hydrocarbon product is produced.
14. Apparatus as defined in Claim 13, installed on an offshore oil and gas production platform.
15. Apparatus as defined in Claim 13, installed on a floating production, storage and offloading vessel.